

Amendments to the Claims:

The following Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Original) A method of manufacturing a molded microneedle array comprising:

providing a negative mold insert characterized by a negative image of microneedle topography wherein at least one negative image of a microneedle is characterized by an aspect ratio of between about 2 to 1 and about 5 to 1;

transferring the negative mold insert into an injection molding apparatus, wherein the negative mold insert is exposed and defines a structured surface of a negative mold cavity;

heating the negative mold cavity to a temperature above the softening temperature of a moldable plastic material;

heating the moldable plastic material to at least the molten temperature of the moldable plastic material in a chamber separate from the negative mold cavity;

injecting the molten plastic material into the heated negative mold cavity,

allowing the molten plastic material to fill at least about 90 percent of the volume of the negative indentations defined by the negative mold insert;

cooling the molten plastic material to a temperature below the softening temperature of the moldable plastic material; and

detaching the molded microneedle array from the negative mold insert.

2. (Original) A method of manufacturing a molded microneedle array comprising:

providing a negative mold insert characterized by a negative image of microneedle topography wherein at least one negative image of a microneedle is characterized by an aspect ratio of between about 2 to 1 and about 5 to 1;

transferring the negative mold insert into an injection molding apparatus, wherein the negative mold insert is exposed and defines a structured surface of a negative mold cavity;

heating the negative mold cavity to a temperature of more than about 10 degrees centigrade above the softening temperature of a moldable plastic material;

heating the moldable plastic material to at least the molten temperature of the moldable plastic material in a chamber separate from the negative mold cavity;
injecting the molten plastic material into the heated negative mold cavity,
allowing the molten plastic material to fill at least about 90 percent of the volume of the negative indentations defined by the negative mold insert;
cooling the molten plastic material to a temperature at least below the softening temperature of the moldable plastic material; and
detaching the molded microneedle array from the negative mold insert.

3. (Previously Presented) A method according to claim 1, wherein the negative mold insert is formed by:

providing a positive mold master member characterized by microneedle topography wherein at least one microneedle is characterized by an aspect ratio of between about 2 to 1 and about 5 to 1;

electroforming a negative mold insert around the positive mold master; and
detaching the negative mold insert from the positive mold master member.

4. (Original) A method according to claim 3, wherein the positive mold master member comprises copper.

5. (Previously Presented) A method according to claim 1, wherein the negative mold insert is fabricated by nickel electroforming.

6. (Previously Presented) A method according to claim 3, wherein the microneedle topography of the positive mold master member is prepared by diamond turning.

7. (Previously Presented) A method according to claim 1, wherein the microneedle array comprises a plurality of microneedles each having a flat tip comprising a surface area measured in a plane aligned with the base of about 20 square micrometers or more and 100 square micrometers or less.

8. (Previously Presented) A method according to claim 1, wherein the microneedle array is formed as part of a larger array, wherein at least a portion of the larger array comprises a non-patterned substrate.

9. (Original) A method according to claim 8, wherein the non-patterned substrate has an area of more than about 0.10 square inch (0.65 cm^2) to less than about 1 square inch (6.5 cm^2).

10. (Previously Presented) A method according to claim 1, wherein the microneedle array comprises a plurality of molded microneedles having a height greater than about 90 percent of the corresponding height of the microneedle topography in the negative mold insert.

11. (Canceled)

12. (Previously Presented) A method according to claim 1, wherein the moldable plastic material comprises a material selected from the group consisting of polycarbonate, polystyrene, polyethylene, polypropylene, and blends thereof.

13-14. (Canceled)

15. (Previously Presented) A method according to claim 2, wherein the negative mold cavity is heated to a temperature of more than about 30 degrees centigrade above the softening temperature of the moldable plastic material.

16. (Previously Presented) A method according to claim 1, wherein the microneedle array comprises a plurality of microneedles having a pyramidal shape.

17. (Previously Presented) A method according to claim 1, wherein the molten plastic material is injected into the heated negative mold cavity with a velocity of less than 2.0 in/sec (5.08 cm/sec).

18. (Previously Presented) A method according to claim 17, wherein after injection of the molten material, it is held at a packed pressure of more than about 6000 psi (40.8 Mpa).

19–30. (Cancelled)